Sewage Treatment, Prof. Dunbar, translated by Dr. H. T. Calvert, illustrated; Hydrographic Surveying: for the Use of Beginners, Amateurs, and Port and Harbour Masters, Commander S. Messum, R.N., illustrated; Theodolite Surveying and Levelling, Prof. J. Park, illustrated. *Longmans and Co.*—Design in Nature: Illustrated by Spiral and other Arrangements in the Inorganic and Organic Kingdoms as exemplified in Matter, Force, Life, Growth Rhythms, Prof. J. B. Pettigrew, 3 vols., illustrated, vol. i.; Principles of Logic, Prof. G. H. Joyce. *Macmillan and Co., Ltd.*—Earthwork of England: Prehistoric, Roman, Saxon, Danish, Norman, and Mediæval, A. H. Allcroft, illustrated; Origin and Development of the Moral Ideas, Dr. E. Westermarck, 2 vols., vol. ii. *Milner and Co., Ltd.*—Psychical Research, F. Podmore. *John Murray.*—Hydrographical Surveying: a Description of the Means and Methods Employed in Constructing Marine Charts, the late Rear-Admiral Sir W. J. L. Wharton, K.C.B., F.R.S., new edition, revised by Rear-Admiral Mostyn Field, illustrated. *Kegan Paul and Co., Ltd.*—Milk Analysis: a Practical Treatise on the Examination of Milk and its Derivatives—Cream, Butter, and Cheese, J. A. Wanklyn, new edition, by W. J. Cooper. *Sir I. Pitman and Sons, Ltd.*—Notes of Lessons on Hygiene and Temperance, Mrs. E. H. Chadwick, introduction by Prof. G. Sims Woodhead, vol. ii.; The Teacher's Course of Elementary Science, F. Belton, Part i., Physics and Chemistry; Part ii., Plant Life. *Swan Sonnenschein and Co., Ltd.*—Thought and Things: a Study of the Development and Meaning of Thought or Genetic Logic, Prof. J. M. Baldwin, 3 vols., vol. iii., Real Logic; Outlines of Psychology, Dr. O. Külpe, translated under the supervision of Prof. E. B. Titchener, a new edition; Physiological Psychology, Prof. W. Wundt, a translation of the fifth and wholly re-written German edition by Prof. E. B. Titchener, in 3 vols., vol. ii., illustrated; Bushman Folklore, L. C. Lloyd, edited by Dr. G. M. Theal, illustrated. *The University Tutorial Press, Ltd.*—Principles and Methods of Physical Education and Hygiene, W. P. Welpton; The Science of Speech: an Elementary Manual of Phonetics for Teachers, B. Dumville. *T. Fisher Unwin.*—Prehistoric Rhodesia: an Examination of the Ethnological and Archæological Evidences as to the Origin and Age of the Rock Mines and Stone Buildings, with a Gazetteer of Mediæval South-East Africa, R. N. Hall, illustrated. *Whittaker and Co.*—Artificial and Natural Flight, Sir H. Maxim, illustrated.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

Cambridge.—At Emmanuel College research studentships have been awarded to members of the college as follows:—150*l.*, T. H. Laby; 140*l.*, R. D. Kleeman; 100*l.*, H. S. Tasker.

Mr. A. R. Brown, who recently returned from the Andaman Islands, where he spent two dry seasons in studying the sociology, psychology, and religion of the pigmy inhabitants, was elected on Monday to a fellowship at Trinity College in recognition of his investigations.

In connection with the visit of the members of the Congress of Electrical Units to Cambridge on Saturday next, it is proposed to confer degrees of Doctor of Science, *honoris causa*, upon Prof. S. A. Arrhenius, Prof. G. Lippmann, Dr. S. W. Stratton, and Dr. E. G. Warburg.

Prof. Bateson will deliver an inaugural lecture in the botanical lecture-room on Friday, October 23, at 5 p.m., on "The Methods and Scope of Genetics."

Mr. G. H. Hardy, of Trinity College, and Mr. J. M. Dodds, of Peterhouse, have been nominated moderators for the year beginning May 1, 1909. Mr. A. Berry, of King's College, and Mr. G. Birtwistle, of Pembroke College, have been appointed examiners for the mathematical tripos, part i. (old regulations), for the same period.

A Grace, gratefully acknowledging the munificent gift to the University by Prof. Liveing of almost the whole of the apparatus and material belonging to him in the chemical laboratory, will be brought before the Senate to-day.

Dr. Charles E. Fawsitt, Graham Young lecturer in metallurgical chemistry in the University of Glasgow, has been appointed professor of chemistry in the University of Sydney, N.S.W.

In addition to the usual course of Hunterian and other lectures to be delivered during the present winter session, the council of the Royal College of Surgeons of England has arranged a series of demonstrations in the theatre of the college at which specimens from the museum will be shown and their bearing on general and surgical pathology discussed. The first demonstration of the series is to be given on Friday, October 16, at 5 p.m., by Dr. Arthur Keith. The demonstrations are open to all medical men and senior students on presentation of their cards.

On October 7 Mr. Herbert L. Storey handed over to Lancaster the extensive buildings of the Storey Institute, which he has erected and equipped at a cost of 10,500*l.* The institute itself was the gift of the late Sir Thomas Storey, to commemorate the jubilee of the late Queen's reign. In the original building are housed the public library, art gallery, lecture theatre, and laboratories for science work. Some time ago the need for an extension was felt, and Mr. Storey offered to erect new buildings. These are now completed. The new buildings provide a workshop for manual training and a class-room for domestic science. Prof. Sadler, in an address at the ceremony, spoke of the signal value of the service which private benefactors like Mr. Herbert Storey render to public education by encouraging manual training for boys and the preparation of girls for their future duties as wives and mothers. He expressed the hope that by means of Mr. Storey's gift Lancaster may find it possible to establish a day continuation school for boys and girls of from thirteen to fifteen years of age, with a course of instruction designed to give preparation for skilled industry and for home duties.

SOCIETIES AND ACADEMIES.

London.

Royal Society, May 21.—"On some Features in the Hereditary Transmission of the Albino Character and the Black Piebald Coat in Rats." Paper ii. By Geo. P. **Mudge.** Communicated by Prof. A. D. Waller.

These experiments show that albinoes breed true to albinism, whether their ancestry is pigmented or not. They further show that, though externally albinoes may appear to be identical with regard to their coat characters, in reality they may be different, and that some exhibit the "ghost" of the self pattern and others that of the piebald pattern. It has been previously known for both animals and plants that some albinoes carry certain colour and pattern factors, while others carry different ones, but this difference has hitherto been elucidated by means of breeding tests alone. These experiments add an ocular demonstration of the actual presence of the coat-pattern in albinoes. The interpretation placed upon the coat appearances in these albinoes is corroborated by the breeding results.

It is further shown that when a piebald black rat (Cr 5) is mated with one of a similar type, two classes of offspring may be obtained. One of these contains all black piebalds and the other a mixture of black piebalds and albinoes in nearly equal numbers.

When a piebald black rat is mated with an albino (=Cr 5×Cr 4), it may be said that, so far as these experiments have gone, five different results will be obtained. They may be stated as follows: (1) The offspring may be all black piebalds. (2) They may be a mixture of black piebalds and albinoes. (3) They may be all "Irish" forms (=a black self-coloured form). (4) They may be a mixture of albinoes, black piebalds, and "Irish." (5) They may contain albinoes, "Irish," and a grey form (=Cr 2). It can be shown that the divergency of the results obtained when two individuals apparently similar are mated is due to the gametic nature of the albino employed.

June 24.—"Preliminary Account of the Habits and Structure of the Anaspidiidæ, with Remarks on some other Fresh-water Crustacea from Tasmania." By Geoffrey **Smith.**

The paper gives an account of observations made on the habits of Anaspides in its natural state, the most important points being its method of running with the body held straight, and the deposition by the female of the fertilised eggs under stones and weeds. An account is also given of the internal anatomy, certain characters, *e.g.* the structure of the heart and of the filiform spermatozoa, suggesting affinity with the Mysidacea, while others tend towards the Decapoda, thus showing the animal to be the most generalised malacostracan known. A member of a new genus, Paranaspides, is also described, which was found in great numbers in the Great Lake of Tasmania; this animal, which bears a strong superficial likeness to Mysis, is transparent, and leads more of a swimming life than Anaspides, which it resembles in essential structure, though not at all in appearance. The other members of the rich crustacean fauna of the Great Lake are referred to, and reasons are given for deriving this fauna from the lost Antarctic continent.

Received August 25.—"Further Results of the Experimental Treatment of Trypanosomiasis: being a Progress Report to a Committee of the Royal Society." By H. G. **Plimmer** and Captain H. R. **Bateman.**

The following results are a continuation of the work of which summaries have already appeared in the Proceedings of the Royal Society (B, vol. lxxix., 1907, pp. 505–16, and B, vol. lxxx., 1908, pp. 1–12) and in NATURE (October 10, 1907, vol. lxxvi., p. 607, and January 9, vol. lxxvii., p. 238). The experiments have been carried out with the same strains of nagana and surra as were used before, the average duration of untreated diseases being 5·5 and 6·9 days respectively.

I.—Nagana Rats treated with Atoxyl and Succinimide of Mercury.—Of these rats two lived more than 300 days, four lived more than 200 days, five lived more than 100 days, and six more than 50 days. None of the above died with any of the signs of nagana. Of the twenty-one rats tabulated only one died from trypanosomiasis, and this one was probably atoxyl-proof. One of these, which was apparently cured, was used on the 147th day after inoculation for re-inoculation, with the view of ascertaining if any immunity had been conferred. This was found not to be the case.

II.—Nagana and Surra Rats treated with Atoxyl and Mercury Sozoiodol.—One rat lived more than 200 days, one more than 100 days, and two more than 50 days, none of them dying from trypanosomiasis.

III.—Nagana and Surra Rats treated with Sodium Antimonyl Tartrate.—Nine of these rats lived for more than 200 days, and nine others considerably more than 100 days. Of those which have died only four have had recurrences, none of them died with any symptoms of trypanosomiasis, and in none were trypanosomes found after death. An emulsion of the liver and of the bone-marrow was injected into other rats in five cases, with negative results in each case.

IV.—Further experiments.—(A) *Nagana Rats treated with Large Doses of Sodium Antimonyl Tartrate.*—The results obtained showed that pushing the drug does not have any good effect; the trypanosomes are not driven out more quickly, or more effectually; recurrences are more common, and inflammatory intestinal lesions were present in nearly every case. Two rats died with living trypanosomes in the blood; these two had become antimony-proof, as the later doses did not remove the trypanosomes from the blood, nor make any difference in their number.

(B) *Rats treated with Sodium Antimonyl Tartrate after Inoculation with Atoxyl-proof Trypanosomes.*—It was found that the atoxyl-proof strains of trypanosomes are less influenced by antimony than are the ordinary variety, as three rats had living trypanosomes in the blood at death, and seven died at a very early date.

(C) *Rats treated with Sodium Antimonyl Tartrate and Antimony (Metal) suspended in a Fatty Medium.*—In order to make the use of antimony practicable in the form of injection, a series of experiments was undertaken, using various other media than water for solution or suspension of the antimony salt. Finally, the medium Colonel Lambkin devised, consisting of palmitin and antiseptics, which is used very largely for the intramuscular injection of mercury, was tried, and found practical. One great advantage of these preparations is that they can be used upon man with far less difficulties and after-consequences than the watery solutions, which seem to be impracticable; this is of importance should antimony be found of use in human trypanosomiasis.

Of thirteen nagana and surra rats treated with a 5 per cent. suspension of sodium antimonyl tartrate, two have lived more than 100 days, each having had only one dose, three lived more than 50 days, and none have died from trypanosomiasis.

The administration of the metal itself in a state of very fine division has a considerable effect on the trypanosomes; it has a distinctly better effect on surra than upon nagana, five surra rats out of sixteen being alive more than 200 days after inoculation, and four others having lived for a long time. In none of the surra rats were trypanosomes found at death, whereas in three of the nagana rats they were present. The metal is much more irritating than the tartrate, but the effect is in most cases more prolonged; this is probably due to the fact that the absorption of the metal is much slower. Further, the smaller doses would appear to be the most efficient.

(D) Antimony (metal) and sodium antimonyl tartrate were given before inoculation to test their effects upon the development of the disease; and the metal was found to be far more effective in delaying the appearance of the trypanosomes in the blood than the salt; this is probably due to its slower elimination. One dose of the metal given the day before inoculation delayed the appearance of the trypanosomes until the eleventh day.

(E) *Rats treated with Lithium Antimonyl Tartrate.*—There are differences in the effects produced by the potassium, sodium, and lithium antimonyl tartrates, if given under similar conditions and dosage. The sodium salt contains, roughly, about 2 per cent. more antimony than the potassium salt, and the lithium salt contains about 2 per cent. more than the sodium; but the doses of the lithium salt have to be much smaller than the corresponding doses of the sodium salt. When the watery solution is injected intramuscularly, it has not caused necrosis of the tissues in rats, but subcutaneously it has occasionally done so. The best strength of solution for rats is 0·25 per cent., and of this 0·5 c.c. has been given for a dose. Out of twelve rats five are alive and well at periods varying from 125 to 134 days. This salt is much more soluble than either the potassium or sodium compound, which may, perhaps, as well as its greater antimony content, account for its greater effectiveness.

(F) *Experiments with Antimony upon Dogs.*—In order to see what the effects of antimony would be on the larger and more important animals when suffering from trypanosomiasis, a series of experiments on dogs has been begun. The trypanosome used was that of surra, which kills dogs of about 20 lbs. in weight in approximately 14 days, as this is the trypanosome which is of practical importance with regard to dogs. Five dogs were treated at first with the suspensions mentioned under C, but we have found, since trying the lithium antimonyl tartrate that this acts more effectually and with less irritation than the creams, whether of metal or salt. All the animals are in good condition and are gaining in weight, three at 62 days and two at 53 days after inoculation.

(G) *Experiments made with Rats treated with Antimony, in order to find out in what Organs the Trypanosomes are latent.*—Eleven rats were inoculated with nagana, which is less affected by antimony than surra, and were all treated with four doses of sodium antimonyl tartrate. The rats were killed at various intervals, and the organs selected (the liver and bone-marrow) were made into an emulsion with a minimum quantity of 0·75 per cent. salt-solution, and injected into other rats in doses of 1 c.c.; the same dose of blood from the heart was also given. In four the results were entirely negative; in three trypanosomes were found in the liver, and in six in the bone-marrow. It would appear that the bone-marrow is the place where the trypanosomes can live longest, and that the liver is also a place where they can find protection. This is borne out by some experiments we have made upon trypanosomiasis in birds, in which cultivations of trypanosomes can often be made from the bone-marrow when they cannot be made either from the organs or the blood The doses given to the above rats were rather less than those which we should judge to be curative, but in four cases the results were entirely negative.

PARIS.

Academy of Sciences, October 5.—M. Émile Picard in in the chair.—A recent change in the aspect of the comet 1908*c* (Morehouse-Borrelly): G. **Bigourdan.** On September 30 the comet possessed a long visible tail, directed from the sun, and at least 15′ long. On October 1 this tail had disappeared, and the head of the comet also appeared less brilliant. Traces of a tail were noted on October 3.—The micro-organisms of intestinal putrefaction: Elie **Metchnikoff.** After reviewing the recent work on the nature and functions of the bacteria found in the normal human intestine, the author regards it as certain that the digestive tube of man contains three species of putrefactive organisms. They occur, not only in the form of spores, but also in their vegetative state of rods. The author is of opinion that the products formed by these bacteria act as poisons, and have a pathogenic *rôle*. These poisons pass through a porcelain filter, and resist the action of boiling water.—Observations of the grey tropical spot of Jupiter: José Comas **Solà.**—The convergence of continued fractions: E. **Nörlund.**—Directed waves in wireless telegraphy and the investigation of syntony: M. **Turpain.** A reclamation of priority as regards the work of MM. Bellini and Tosi and M. Slaby.—Studies on the association in series and in parallel of electrolytic detectors: M. **Jégou.** The combination of two or more electrolytic detectors in series causes a loss in sensibility, the arrangement being always less sensitive than any one of the detectors used alone. The arrangement in parallel may give results which are practically useful.—The analysis of the non-liquefiable gases in liquid air: F. **Bordas** and M. **Touplain.** The apparatus described by the author in a preceding paper for the investigation of the small quantities of gases contained in minerals has been modified to analyse the gases which escape liquefaction during the fractional distillation of liquid air. The gases used were supplied by M. Claude, and were submitted to fractional absorption by charcoal cooled to different temperatures. The spectrum of the mixture of neon and helium thus obtained is given and compared with Baly's figures.—Size of the molecules and charge of the electron: Jean **Perrin.**—The microchemical reactions of arsenic applicable in legal medicine: G. **Denigès.** The drop of the liquid containing the arsenic in the form of an arsenate is evaporated to dryness on the microscope slide, and then treated with the reagent (silver nitrate or magnesia mixture), with certain precautions described. Characteristic crystals are obtained in this way.—The active pinonic and pinic acids: Ph. **Barbier** and V. **Grignard.** The pinenes employed in this investigation were strongly active, and the corresponding acids obtained by oxidation were also strongly active in rotatory power.—The estimation of succinic acid in wines and in other fermented liquids in the presence of fixed acids: Emm. **Pozzi-Escot.**—The effect of dialysis on the ferments from plant juices: C. **Gerber.**—A young giraffe from eastern Soudan recently arrived at the museum menagerie: E. L. **Trouessart.**—A hydrological law of Minard and Belgrand: E. **Maillet.** The author's measurements lead to a slight modification of this law.

DIARY OF SOCIETIES.

FRIDAY, OCTOBER 16.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Repairs, Renewals, Deterioration and Depreciation of Workshop Plant and Machinery: J. E. Darbishire.

WEDNESDAY, OCTOBER 21.

ROYAL MICROSCOPICAL SOCIETY, at 8.—The Mouth Parts of the Nemocera and their Relation to the other Families in Diptera; Corrections and Additions to the Paper published in 1904: W. Wesché.—(1) On the Resolution of Periodic Structures; (2) An Auxiliary Illuminating Apparatus: E. M. Nelson.

ENTOMOLOGICAL SOCIETY, at 8.—On Diaposematic Resemblances in Insects; a Reply to Mr. G. A. K. Marshall: Dr. F. A. Dixey.

THURSDAY, OCTOBER 22.

CHEMICAL SOCIETY, at 8.30.—The Passage of Hydrogen through a Palladium Septum, and the Pressure which it produces: D. Tsakalotos.—The Relationship of Colour and Fluorescence to Constitution, Part ii., Rhodamines of Mellitic Acid: O. Silberrad and C. S. Roy.—Constitution of the Fluorescences of Mellitic and Pyromellitic Acid: O. Silberrad.—A New Form of Gas Burette: A. E. Hill.—A Molecular Compound of Trinitroacetaminophenol and β-Naphthol: R. Meldola and J. G. Hay.—Reduction Products of Azoxybenzene, Preliminary Notice: L. H. Berry.—Constitution of the Salts of the Phthaleins, and the Cause of Colour in the Triphenylmethane Series: A. G. Green.—Chlorination of *p*-Nitraniline: B. Flürscheim.—Relation between Absorption Spectra and Chemical Constitution, Part x., Unsaturated Acids of the Benzene Series: E. C. C. Baly and K. Schaefer.—Condensations with Monochloromethyl Ether, Part i., Condensation of Monochloromethyl Ether with Ethyl Malonate and Ethyl Isopropyl Malonate: J. L. Simonsen.—Relation between Chemical Constitution and Physiological Action in Certain Substituted Aminoalkylesters: F. L. Pyman.—Effect of Constitution on the Optical Rotatory Power of Optically Active Nitrogen Compounds, Part iii.: R. W. Everatt and H. O. Jones.

FRIDAY, OCTOBER 23.

PHYSICAL SOCIETY (National Physical Laboratory), at 3.30.—Demonstrations of Work in Progress in the Laboratory.

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